LiPo/LiFeDiMATIC Operating Instructions

To the Controller:

p= orange, white

+= red

- = brown, black

To the Receiver

(p = pulse, signal)

To the balancing connector of the battery
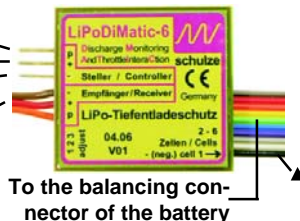
The principle of connection
(cell arrangement as the storeys in a high-rise building)

+ cell 5 (fifth storey)   **etc.**
+ cell 4 (fourth storey)   = - cell 5
+ cell 3 (third storey)   = - cell 4
+ cell 2 (second storey) = - cell 3
+ cell 1 (first storey)   = - cell 2
▲ **- cell 1** (ground floor)   = earth

Dear customer,

Congratulations on your choice of the *LiPoDiMATIC* or the *LiFeDiMATIC*. This product makes it much safer to use Lithium batteries in your model.

Every one of your models which is powered by these expensive batteries really should carry a *LiPoDiMATIC* or a *LiFeDiMATIC*; it is as essential a unit as the balancer you always use when charging the Lithium battery.

1   Method of working

The **LiPo/LiFeDiMATIC** monitors each individual cell of your flight battery, checking for low voltage.

The **LiPo/LiFeDiMATIC** throttles back the motor well before any cell reaches the deep-discharged state - far less of the reversal of the polarity. This causes the battery voltage to rise again slightly, thereby avoiding the danger of deep-discharged cells.

If battery voltage continues to fall, the unit finally cuts the motor to avoid a deep-discharge situation.

2   LED indicator

When you initially connect the **LiPo/LiFeDiMATIC** to the flight battery, the integral LED flashes to indicate the flight pack's cell count; this continues for a short period (one minute).

If the unit detects low cell voltage during flight operations, the integral LED flashes to indicate the number of the cell in the pack whose voltage was (or is) low.

This indicator goes out one minute after the **LiPo/LiFeDiMATIC** receives its last signal from the receiver (receiving system switched off). The indicator can be re-activated by switching the receiving system on again.

If the balancing cable is connected wrongly to the LiPo/LiFeDiMATIC then the LED blinks quickly without pause.

3   Installation at the battery end

The **LiPo/LiFeDiMATIC** is connected to the balancer lead attached to the flight battery. The **LiPo/LiFeDiMATIC** version should be chosen to match the balancer connector:

• LiPoDiMATIC-**SE**4   when the battery is equipped with a **S**chulze **E**lektronik BalCab10 socket.
• LiPo/LiFeDiMATIC-**SE**7 or -**SE**14   when the battery is equipped with a **S**chulze **E**lektronik BalCab20 socket.
• LiPoDiMATIC-**TP**xx   when a **T**hunder**P**ower or FlightPower battery is used.
• LiPo/LiFeDiMATIC-**KO**xx   when the battery is equipped with a **Ko**kam (Graupner, Robbe) socket.
   A lot of any other connectors with a pin spacing of 2.54 mm can also be used - although it may be necessary to re-connect the wires to obtain the correct sequence, or to "fill" vacant contacts.

4   Installation at the receiver end

The "servo lead" attached to the **LiPo/LiFeDiMATIC** should be connected to the throttle channel socket at the receiver.

The "servo lead" attached to the speed controller or governor should be connected to the right-angled 3-pin socket on the unit.

Note: the lead must be connected with the negative wires (brown or black) of the two cables facing each other.

If several batteries (several individual packs wired in series, or parallel-wired packs) are to be monitored by **LiPo/LiFeDiMATIC** units, then the units must be wired together in series: the servo lead attached to the **LiPo/LiFeDiMATIC** is connected to the right-angled three-pin socket on the other **LiPo/LiFeDiMATIC**, instead of to the receiver (See wiring example 3).

5   Speed controller / governor with BEC or opto-coupler

The **LiPo/LiFeDiMATIC** works correctly with both types of speed controller (opto-coupler or BEC) without any modification.

The conductor cross-section of the "servo lead" attached to the types for low cell counts are destined for BEC mode operations (higher cross section). The "servo lead" of the types of higher cell counts is thinner (and therefore lighter) for the use with an opto-coupler imnput stage which are used for reasons of safety.

The right-angled three-pin socket is another very deliberate feature, as the pins of most "servo leads" usually consist of nothing more than sheet metal contacts, which cannot cope with heavy currents.

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6   Requirements (Hint: As a rule in Futaba transmitters the throttle channel has to be switched to "servo reverse")
   The **LiPo/LiFeDiMATIC** can only work if your speed controller works with a shorter pulse signal (from the receiver or transmitter) at "motor stopped" or "brake on" than at "full-throttle". If this is not the case, the unit would apply full-throttle to the motor as the battery became flat, instead of reducing motor speed and thereby reducing current drain.

The 3-pin connector type is deliberated used, because the normal plugs in a servo connector are normally made from bended sheet matal which have a higher resistance than a massive plug.

7   Adjustments / Matching

The **LiPo/LiFeDiMATIC** can be configured to react to low cell voltage in different ways, making it suitable for various types of application.

It is possible to select the voltage limits to provide for different residual motor run times. You can also set up the unit so that the motor generates a "battery almost flat" signal to alert the pilot.

7.1   Voltage limit value LiPo (LiFe) and belonging solder pad confifgurations Pad 1 und Pad 2

The voltage limit values are dictated by the state of the solder pads 1 and 2:

• **Throttle reduction at 2,5 (2,0) V Pad 1 soldered, Pad 2 open =** pure cell protection function.
   When the unit reduces the throttle, the battery is flat, i.e. no motor run time remaining.

• **Throttle reduction at 2,8 (2,2) V Pad 1 open,   Pad 2 soldered =** Selection for saving some final run time. Setting for cells which are operated at the limit of their maximum load capacity.

• **Throttle reduction at 3,1 (2,4) V Pad 1 open,   Pad 2 open =**   (default state)
   This setting provides an energy reserve of about one airfield circuit at reduced throttle.

• **Throttle reduction at 3,3 (2,6) V Pad 1 soldered, Pad 2 soldered =** Setting for cells which are discharged at low currents compared to the maximum permissible load.

1 2 3
1 = soldered
2,3= open

7.2   Throttle reduction behaviour / Solder pad configurations

7.2.1 Linear throttle reduction when the voltage of the most deeply discharged cell falls to the set limit. The motor is continuously throttled back until it stops.
   Recommended applications: gliders, helicopters.
   Configuration: pad 3 = open

Heat shrinking tube cut open and lid high

1 2 3
all soldered

7.2.2 Staged throttle reduction when the voltage of the most deeply discharged cell falls to the set limit. When a cell first falls to the low voltage limit, the unit forces a distinct reduction in throttle, with the aim of warning the pilot that the battery will soon be flat, and that he should initiate the landing. Thereafter the unit permits a maximum throttle setting of around 85% of the value which has been used up to now. This causes the battery voltage to rise again slightly.
   If the voltage again falls below the low voltage limit, the unit reduces the throttle setting again.
   Recommended application: fixed-wing sports model aircraft, boats
   Configuration: pad 3 = soldered

8   Special notes
   • Disconnect the controller / governor from the Lithium flight battery when not in use (to avoid deep-discharging).
   • The **LiPo/LiFeDiMATIC** should not be left connected to the battery for days on end, as the voltage divider (used to measure the cell voltages) will slowly discharge and unbalance the pack.
   •The LED display function is reset when the **LiPo/LiFeDiMATIC** is disconnected from the Lithium battery.

9   Specifications

Ordering Information	Cells	Connector type	Weight about	Servo cable	Current draw
LiPoDiMATIC-SE4	2 - 4 LiPo	Schulze BalCab10	16 g	3*0,34 mm^2	0,12 - 1,2 mA
LiPoDiMATIC-SE7	2 - 7 LiPo	Schulze BalCab20	17 g	3*0,14 mm^2	0,12 - 1,5 mA
LiPoDiMATIC-SE14	2-14 LiPo	Schulze BalCab20	21 g	3*0,14 mm^2	1 - 3 mA
LiPoDiMATIC-Ko6	2 - 6 LiPo	7 pins univ., spacing 2.54mm	15 g	3*0,34 mm^2	0,12 - 1,5 mA
LiPoDiMATIC-Ko2x4	2*2-4 LiPo	2*5 pins univ., spacing 2.54mm	17 g	3*0,34 mm^2	0,12 - 1,5 mA
LiPoDiMATIC-TP5	4, 5 LiPo	ThunderPower/FlightPower	16 g	3*0,34 mm^2	0,12 - 1,5 mA
LiPoDiMATIC-TP8	2,3,6,7,8 LiPo	ThunderPower/FlightPower	17 g	3*0,34 mm^2	0,12 - 1,5 mA
LiPoDiMATIC-TP14	2-14 LiPo	ThunderPower/FlightPower	21 g	3*0,14 mm^2	1 - 3 mA
LiFeDiMATIC-Ko8	3 - 8 LiFe	9 pins univ., spacing 2.54mm	16 g	3*0,34 mm^2	0,12 - 1,5 mA
LiFeDiMATIC-SE7	3 - 7 LiFe	Schulze BalCab20	17 g	3*0,14 mm^2	0,12 - 1,5 mA
LiFeDiMATIC-SE14	3-14 LiFe	Schulze BalCab20	21 g	3*0,14 mm^2	1 - 3 mA

rechts / right

LiPoDiMATIC-SE14 mit BalCab20 Stecker
für 5s - 14s Packs
LiPoDiMATIC-SE14 w. BalCab20 plug
for 5s - 14s packs

Ohne Abb. / No picture
LiPoDiMATIC-SE7 mit BalCab20 Stecker
für 2s - 7s Packs
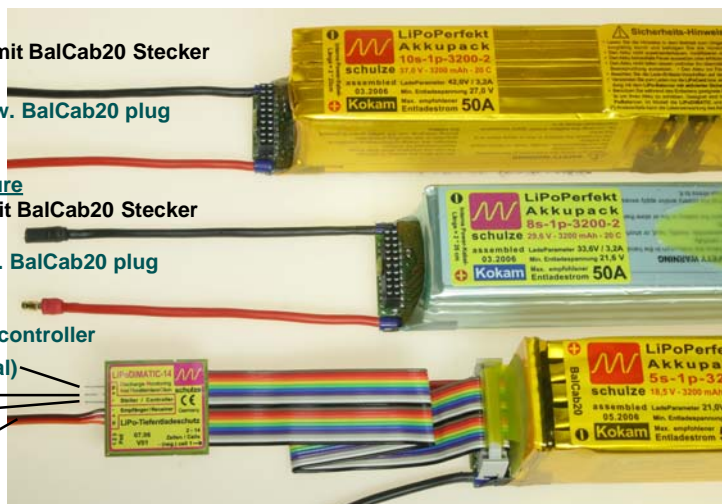LiPoDiMATIC-SE7 w. BalCab20 plug
for 2s - 7s packs

Zum Steller / To the controller

Impuls / pulse (signal)
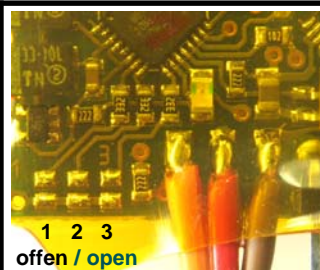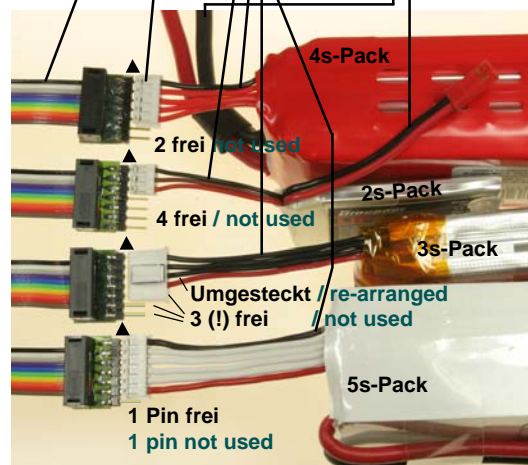Plus / pos.
Minus / neg.
Zum Empfänger
To the receiver

unten / below

LiPoDiMATIC-Ko6 mit Universal-Stecker für 2s-6s Packs
LiPoDiMATIC-Ko6 with universal plug for 2s - 6s packs

Achtung: Die Anschlussbuchsen (weiblich) des Balancer-Kabels müssen evtl. umbelegt werden um die Hochhaus-Konfiguration (Seite 1 rechts oben) zu erhalten.

Caution: It may be necessary to re-arrange the female sockets of the balancer cable in order to obtain the cell arrangement as shown at the top of page 1 („high rise building").
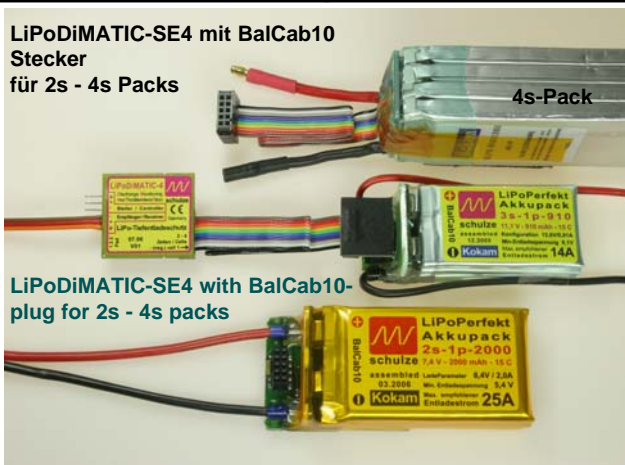
▲ = schwarz = Pin1 = „-" Zelle 1 = „-" Akku
= black = Pin1 = neg. cell 1 = neg. battery

1 2 3
offen / open

Löt-Pads im Auslieferzustand
Solder pads at delivery state

4s-Pack

2 frei / not used

4 frei / not used

2s-Pack

3s-Pack

Umgesteckt / re-arranged
3 (!) frei / not used

5s-Pack

1 Pin frei
1 pin not used

LiPoDiMATIC-SE4 mit BalCab10
Stecker
für 2s - 4s Packs

4s-Pack

LiPoDiMATIC-SE4 with BalCab10-
plug for 2s - 4s packs

Gas-Kanal
Throttle-channel

Drehzahlsteller mit BEC, nicht LiPo-fähig

Speed controller with BEC, not for LiPo batteries

Balanceranschluß
Balancing connector

Verdrahtungsbeispiel 1 / Typical wiring arrangement 1

Drehzahlsteller/-regler mit Optokoppler / Speed controller with opto-coupler

Zusatzkondensatoren wegen langer Powerkabellänge
Additional capacitors required for long power cables

2 * 26 cm interne Kabellänge im Akkupack!
2 * 26 cm (2 * 10") internal „power cable" length of the battery

LiPoDiMATIC-SE14

Empfänger / Receiver

Empfänger-Akku
Receiver battery

Verdrahtungsbeispiel 2 / Typical wiring arrangement 2

Empfänger
Receiver

Zwei / two
LiPoDiMATIC
seriell verschaltet
wired in series

Zwei Packs à 4s = 8s
Two packs of 4s = 8s

Steller-/
Regler
Speed
controller

Verdrahtungsbeispiel 3 / Typical wiring arrangement 3